

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-7, 9-17 and 19-21 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the amendments and remarks as set forth below.

Entry of Response

Applicants submit that entry of the present response and full consideration thereof is proper since no amendments are being submitted, but only remarks.

Allowable Subject Matter

It is gratefully acknowledged that the Examiner considers the subject matter of claims 2, 5, 12 and 15 as being allowable if rewritten in independent form. Applicants believe that the independent claims from which these claims depend are also allowable so that these claims have not yet been rewritten in independent form.

Telephone Interview

Applicants note with appreciation the courtesy extended by Examiner Luu during a telephone interview on June 26, 2006. At that interview, Applicants presented arguments that the claims require a fixed frequency PWM signal generating circuit while the reference shows the generation of fixed amplitude signals. No agreement was reached during the interview,

however, the present response is being submitted to formalize these arguments and to give the Examiner the opportunity for full consideration thereof.

Rejection Under 35 USC 102

Claims 1, 4, 7 and 9 stand rejected under 35 USC 102 as being anticipated by Seong (U.S. Patent 5,606,296). This rejection is respectfully traversed.

The Examiner states that Seong shows in Fig. 3 an apparatus having a duty cycle converting circuit 301 for receiving a first PWM signal and then generating a duty cycle reference voltage V_{com} based on a first duty cycle of the first PWM signal. The Examiner also refers to the rest of the circuit as a frequency fixed PWM signal generating circuit coupled to the duty cycle converting circuit for receiving a duty cycle reference voltage and outputting a second PWM signal having a fixed frequency.

Applicants disagree with the Examiner that the Seong reference shows a frequency fixed PWM signal generating circuit and that the second signal has a fixed frequency. In reviewing the Seong reference, Applicants can only determine that the output signal has a fixed amplitude rather than a fixed frequency. Likewise, Applicants submit that the comparator 302 and the associated other elements only form an amplitude fixed PWM signal generating circuit. Thus, Col. 2, line 55 discusses the constant amplitude of the sawtooth voltage V_{tr} . Col. 3, line 32 points out that comparator 302 modulates the pulse width of the sawtooth voltage V_{tr} . Col. 4, lines 6-11 discuss constant amplitudes and that the output of comparator 302 is a pulse width modulating signal which remains stable. Applicants have found no indication in the reference that the output signal has a fixed frequency or that this comparator is a frequency fixed signal generating circuit.

The purpose of the claimed invention is to fix the frequency of the output PWM signal (page 2, line 21 to line 23) for providing a relatively high frequency, such as 10 kHz or more, to

operate the fan motor 12 to avoid the noise. According to the claimed invention, the buffer circuit includes a frequency-fixed PWM signal generating circuit. The generating circuit is coupled to a duty cycle converting circuit, for receiving the duty cycle reference voltage and then outputting a second PWM signal having a fixed frequency. In other words, the output second PWM signal in the present invention has a fixed frequency.

However, Seong only teaches to maintain the voltage amplitude ΔV of the sawtooth wave so as to reach the system optimization, as shown in the figure 4A to 4C and described in the column 4 line 6 to line 11. In other words, the output signal in the Seong has a fixed amplitude ΔV .

The last paragraph of claim 1 makes it clear that the signal generating circuit is a frequency fixed PWM signal generating circuit and that the output is the second PWM signal having a fixed frequency. Applicants submit that the Seong reference does not contain these two features and that accordingly, claim 1 is allowable thereover.

Claims 2-7 and 9 depend from claim 1 and as such are also considered to be allowable. The Examiner has already indicated that claims 2 and 5 are allowable. Applicants submit that the remaining claims are also allowable based on their dependency from allowable claim 1. Furthermore, these claims include additional limitations which make them additionally allowable. For example, claim 4 includes a description of a frequency controller to determine the fixed frequency of the second PWM signal and the PWM signal generator coupled to the duty cycle converting circuit and the frequency controller. Applicants submit that these limitations are also not seen in the reference.

Rejection Under 35 USC 103

Claims 3 and 20 stand rejected under 35 USC 103 as being obvious over the Seong reference. The Examiner points out that it would be obvious to incorporate a software program.

Applicants submit that even if this is correct, claim 3 remains allowable based on its dependency from allowable claim 1. Claim 20 is another independent claim which includes the limitations of claims 1 and 3. Applicants submit that this claim is allowable for the same reasons recited above in regard to claims 1 and 3.

Claims 6, 10, 11, 13, 14, 16, 17, 19 and 21 stand rejected under 35 USC 103 as being obvious over Seong in view of Hoffman (U.S. Patent 5,457,435). This rejection is respectfully traversed.

The Examiner admits that Seong does not disclose a resistor having a terminal connected to an output terminal of the operational amplifier. The Examiner relies on Hoffman to show such an operational amplifier 224 having an output coupled to a resistor 230. Applicants submit that even if the Examiner is correct that Hoffman shows the combination of the operational amplifier and resistor that it would not necessarily be obvious to incorporate this teaching into Seong since there is no motivation to make such a combination. The Examiner further states that the limitation of controlling the speed of the fan motor is an intended use. Applicants disagree with this since the preamble includes the fan motor as part of the description of the control circuit. Further, immediately before the “thereby” clause, it is stated that the driving circuit outputs a driving signal to the fan motor. Since the references do not show such a fan motor, Applicants submit that this would also not be obvious.

The circuit of claim 10 includes a duty cycle converting circuit and a frequency-fixed PWM signal generating circuit. The duty cycle converting circuit may receive a first PWM signal and then generate a duty cycle reference voltage based on a duty cycle of the first PWM signal. The frequency-fixed PWM signal generating circuit may receive the duty cycle reference voltage and then output a PWM signal having a fixed frequency. In other words, the output second PWM signal in the present invention has a fixed frequency.

The cited combination, does not teach or suggest the claimed invention. In particular, Seong only teaches to generate a PWM signal with fixed voltage amplitude ΔV . See, Figures 4A

to 4C and described in the column 4 line 6 to line 11. Seong does not, however, teach or suggest to generate a PWM signal with fixed frequency. In other words, the output signal in the claimed invention has a fixed frequency. However, the output signal in the Seong has a fixed amplitude. The meaning of the signal frequency is different from the meaning of the signal amplitude. That is, the circuit of the claimed invention and the Seong respectively perform in a substantially different way to generate a substantially different result. Therefore, Seong does not teach the claimed invention.

More importantly, claim 10 describes the PWM buffer circuit as converting the first signal into a second signal having a fixed frequency and a second duty cycle. As discussed above in regard to claim 1, Applicants submit that Seong does not show a signal having a fixed frequency. Accordingly, Applicants submit that claim 10 is likewise allowable.

Claims 11-17 depend from claim 10 and as such are also considered to be allowable. The Examiner has already indicated that claims 12 and 15 are allowable. Applicants submit that the remaining claims are also further allowable based on further limitations described therein. In particular, it is noted that claim 14 describes the frequency controller and PWM signal generator in a similar fashion to claim 4. Applicants submit that this claim is further allowable.

Claim 21 is also considered to be allowable since it is essentially a combination of claims 10, 11 and 13. This claim is considered to be allowable for the same reasons recited above in regard to these claims.

Conclusion

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on the Examiner, either alone or in combination. In view of this, reconsideration of the rejections and allowance of all of the claims are respectfully requested.

If the Examiner has any questions or comments, please contact Robert F. Gnuse, Reg. No. 27,295 at the offices of Birch, Stewart, Kolasch & Birch, LLP.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

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Respectfully submitted,

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